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ABSTRACT

This paper discusses the use of the terms "competence" and "performance" in teacher education. The education literature differentiating between the two concepts is reviewed. The author borrows a number of concepts from the field of linguistics, especially those of Chomsky and his colleagues, to construct a theory with respect to teacher education. Using as an analogy the distinction linguistics make between "competence" and "performance" in language formation, the author defines "teaching performance" as what the teacher actually does; i.e., observable teacher behavior; and "teaching competence" as the underlying, tacit knowledge which a teacher possesses, including knowledge of content, pedagogy, and sociocultural settings. She adds that teaching competence is not a systematic inventory of items but a system of generative processes in the mind of the teacher that he or she is capable of storing and utilizing. The author stresses the need for distinguishing between performance and competence, with the result that observation would be limited to teaching performance, which does not perfectly reflect a teacher's competence. The author notes that reaction to this distinction will depend on the individual's role in teacher education. Use of Bayesian analysis for making predictions about teaching behavior is suggested. (JA)

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A THEORETICAL REFORMULATION OF THE CONCEPTS OF COMPETENCE AND PERFORMANCE IN TEACHER EDUCATION

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Queens College
of The City University of New York

Paper prepared for the Annual Meeting
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A THEORETICAL REFORMULATION OF THE CONCEPTS OF COMPETENCE AND PERFORMANCE IN TEACHER EDUCATION[1]

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The literature on performance-based teacher education (or competency-based teacher education) is now vast. It ranges from (1) "it happened here" articles and monographs (Burke, 1972; Dodl, 1972; Getz, Kennedy, Pierce, Edwards, & Chesebro, 1973; Houston & Howsam, 1974; Parker, 1974; Shearron & Hohnson, 1973; Sybouts, 1973) to (2) "how to" books (Cooper & Weber, 1973; Houston, 1972; Houston & Howsam, 1972; Popham & Baker, 1973) to (3) pronouncements by commissions and committees (McDonald, 1974; Rosner, 1972) to (4) special journal issues on the topic (Journal of Teacher Education, Fall 1973; Phi Delta Kappan, January 1974) to (5) directives from State Education Departments (Gottsegen & Milgrim, 1973; Greenhouse, 1974; New York State Education Department, 1972a; New York State Education Department, 1972b; New York State Regents, 1972; Wilson & Curtis, 1973).

For the most part, the terms competence and performance are being used interchangeably. The January 1973

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issue of Phi Delta Kappan, for example, carried two articles about new teacher education programs at the University of Nebraska and Illincis State University. One article was entitled "Performance-Based Teacher Education: Does it Make a Difference?" (Sybouts, 1973) and the other was captioned "From Traditional to Competency-Based Teacher Education" (Getz, Kennedy, Pierce, Edwards, and Chesebro, 1973), but both articles appear to be dealing with the same concept. By the time the Kappan put out its special issue on the subject this January, it had combined the two terms for this movement (cbte and pbte) into a single cover-page acronym: C/PBTE.

Massanari acknowledges that some people prefer the term performance based rather than competency based. He suggests:

> there are arguments which support both viewpoints. In this paper, the term competency-based teacher education is used . . . because it implies a dimension of quality for teacher behavior (performance is essentially a neutral concept). (Massanari, 1973, p. 244)

Dodl also acknowledges that recent literature has produced several definitions of competency, and that such variance in definition is not without problems. His position is that

> CBTE's purpose is to prepare teachers who competently perform teaching functions. Performance includes producing desired results on the part of learners taught (Dodl, 1973, p. 194).

There is quite a difference in performance being the neutral term Massanari speaks of and performance including student achievement.

Schalock takes a hierarchical approach, assigning the labels job, function, activity, task, and action to descending levels in the hierarchy. Competency then is the demonstrated ability to perform to criterion at function and job levels, while the term skill is used to refer to the ability to perform at each level (Schalock, 1973).

Houston seeks to note a difference between competence and performance by giving an illustration:

> When one analyzes the performance of a violin soloist at the symphony, certain skills become apparent. He must be able to read music, properly handle the bow, tune the instrument, and have a certain stage presence. So must the beginner at the seventh grade concert. The differences are in the criteria which are acceptable for an adequate performance. What is more than adequate in one instance is unacceptable in another. (Houston, 1972, p. 21)

While the above example is clear, it is not clear that Houston is able to continue to distinguish between competence and performance in the rest of the book on strategies and resources for developing a competency-based teacher education program.

Finally, to cite just one other writer on this matter, Howell hints at there being a difference in the terms--competence and performance--but summons only dictionary definitions, current usage, and common sense in arguing the case. (Howell, 1971, pp. 3-5)

There is a strong need then for a reconceptualization of the terms competence and performance. Indeed much of the writing on the development of competency-based (performance-based) teacher education programs would be clearer if these basic notions were clarified. This paper thus seeks to present a reformulation of the concepts of competence and performance in teacher education.

One approach in theory construction is what has come to be called "theory translating"--a procedure in which existing theories and models similar to the kinds of theory needed in a new domain are translated or substituted in whole or part. Snow has suggested that significant development of theory and research related to teaching might be obtained through wider use of this technique (Snow, 1973, p. 100).

Maccia and her colleagues have made several attempts, for example, to model educational theory on theories drawn from other disciplines (Maccia, Maccia & Jewett, 1963). Open-system theory as a conceptual language for understanding and describing many kinds of phenomena--although originating with von Bertalanffy's work in biology--has been borrowed quite successfully by Katz and Kahn as an approach to understanding organizations (Johnson, Katz, and Rosenzweig, 1967, pp. viii-ix).

The goal of this paper then is to borrow from the field of linguistics a number of existing concepts (approximately ten concepts, in fact) to aid in theory construction with respect to teacher education. It seems reasonable to do this, since much of the work of the last ten years on teaching behavior has focused on the language of the classroom anyway. (Bellack, Kliebard, Hyman, & Smith, 1966; Flanders, 1970; Westbury & Bellack, 1971; Travers, 1973).

One can think about language in either of two ways. There are, first of all, actual acts of speaking and hearing, taking place in time, subject to various distractions, limited by memory, and the general weaknesses of the human being. These were called actes de parole by de Saussure (de Saussure, 1916) and performance by Chomsky (Chomsky, 1957).

The second aspect of language is the knowledge of syntax, meaning, and sound that makes performance possible. De Saussure called such knowledge langue and Chomsky has called it competence.

A sharp distinction between competence and performance has thus been traditional in linguistics since de Saussure's Cours de linguistique generale and was first drawn at least as early as the eighteenth century (McNeill, 1970, p. 145).

Competence, then, in linguistics does not have the colloquial meaning of "adequacy." Rather, it is a technical term, and as used by Noam Chomsky it refers to the non-conscious, tacit knowledge that underlies behavior (Cazden, 1972, pp. 3, 299).

Hymes uses the term "communicative competence" for the nonconscious, tacit knowledge underlying communicative behavior, including both knowledge of language in its usual and narrow sense of syntax, phonology, and semantics, and knowledge of the social world and of rules for using language in that world so that speech is both appropriate as well as grammatical, creative both linguistically and sociolinguistically (Hymes, 1971).

The distinction between a theory of competence (a grammar) and a performance model is particularly relevant, according to Chomsky and Halle, to the discussion of vowel reduction.

> In actual speech, the reduction of vowels is determined not only by the functioning of the underlying grammatical rules, but also by a variety of other factors (speed, casualness, frequency of use of the item, predictability in a particular context, etc.). These factors interact in complex and not very well-understood ways to determine the extent and place of vowel reduction, and they result, as well, in many other modifications of underlying grammatically determined forms (slurring, consonant elision, etc.). The grammar, itself, here as always, generates only an idealized representation. A theory of performance will necessarily incorporate the grammar, but will also attempt to study the many other factors that determine the actual physical signal. (Chomsky & Halle, 1968, p. 110)

The grammar of a language, then, as conceived by Chomsky, is an idealized description of the linguistic competence of native speakers of that language. Any model of the way this competence is put to use in actual performance will have to take into account such factors as memory limitations, time

restrictions, etc. (Lyons, 1970, p. 94). Because a grammar is concerned with knowledge, not behavior, factors that are important to performance can be disregarded when thinking about competence (McNeill, p. 146).

Competence, on the one hand, then, is an idealization, an abstraction away from performance (Chomsky, 1965). Theories of performance and competence, therefore, deal with different topics. A grammar is not a receipe for producing sentences. That receipe will be given by a theory of performance. Indeed, says Miller, the problem for a theory of performance is to explain just how the information represented by a grammar is realized in actual acts of speaking and hearing (Miller, 1962).

Performance, on the other hand, is linguistic behavior, either encoding or decoding speech. At the present time, there are essentially no theories of linguistic performance. Indeed, there is only the most tentative knowledge of the relevant parameters of such a theory. (McNeill, 1970)

The distinction which Chomsky and his colleagues draw between competence and performance then is one between the sentences generated by a grammar and a sample of the utterances produced, in normal conditions of use. Chomsky himself stresses that many of the utterances produced by native speakers (samples of their "performance") will, for various reasons, be ungrammatical.

This distinction, says Labov, is particularly sharp when comparing the child's underlying competence and his performance:

> every good teacher knows that what a child says in class is determined by many factors besides his knowledge of English. His knowledge is an abstract, often unconscious pattern which may or may not be activated by . . . (Labov, 1969, p. 9).

It should be pointed out that there are those, such as Lyons, who suggest that although a distinction between competence (the speaker-hearer's knowledge of his language) and performance (the actual use of language in concrete situations) is undoubtedly both a theoretical and a methodolocical necessity, "it is by no means certain that Chomsky himself draws it in the right place" (Lyons, 1970, p. 130).

To some extent, Chomsky, in his more recent work, concedes Lyons' point:

> It must, incidentally, be borne in mind that the specific competence-performance delimitation provided by a grammar represents a hypothesis that might prove to be in error when other factors that play a role in performance and interrelation of these various factors come under investigation. Although this is not usually a serious problem in grammatical study, it does become a real issue when we turn to low-level phonetic processes such as those we are now investigating. Since other aspects of performance have not been systematically studied, our attempt to delimit the boundary of underlying competence by providing specific rules for vowel reduction must be taken as quite tentativa. When a theory of performance ultimately emerges, we may find that some of the facts we are attempting to explain do not really belong to grammar but instead fall under the theory of performance, and certain facts that we neglect, believing them to be features of performance, should really have been incorporated in the system of grammatical rules (Chomsky & Halle, 1968, p. 111).

Linguistic theory then is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech

community, who knows his language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, errors in applying his knowledge of the language in actual performance. Only under such an idealization is performance a direct reflection of competence, says Chomsky (Chomsky, 1965, p. 4). In actual fact, Chomsky points out, it obviously could not directly reflect competence, since a record of natural speech will show numerous false starts, deviations from rules, changes of plan in mid-course, etc.

Linguistics also distinguishes between the observational adequacy and the descriptive adequacy of a grammar. A grammar is observationally adequate, says Dale, if it accounts for, that is, generates, the sentences that have been observed. A descriptively adequate grammar, on the other hand, is capable of these accomplishments in a way that agrees with the competence of native speakers (Dale, 1972). A descriptively adequate grammar, thus, goes beyond the actual set of sentences that have been observed and makes predictions.

There is the related problem of sampling. Does the absence of an item from a person's speech mean that he cannot produce it or merely that he has not found it necessary to produce it? It is difficult, notes Dale, to decide also if an observed difference between a child's speech and adult language is due to different competence or to performance factors (Dale, 1972).

Language acquisition, a line of inquiry pursued vigorously by Brown and Bellugi (Brown & Bellugi, 1964; Bellugi & Brown, 1964), Carol Chomsky (1969), Cazden (1965, 1967, 1968), Menyuk (1969), Slobin (1967, 1970), and others touches both sides of the langue vs. parole (competence-performance) construct. A confusing paradox exists in this connection. There is general agreement that grammatical performance is based on grammatical knowledge, and simultaneous agreement that explicit teaching of that knowledge has no effect on that performance (Cazden, 1972, p. 240; Mellon, 1969).

Cazden sees in this paradox the implication that neither practice for practice's sake, nor maxims for maxim's sake, will suffice. Both have to serve a personal purpose, an intentionality that alone provides the personal meaning which binds the parts into the whole (Cazden, 1972, p. 242). This interpretation seems to be in keeping with Polanyi's view of how items are incorporated into personal knowledge and thereby assimulated into skilled performance (Polanyi, 1964).

Polanyi notes the disorganizing effect caused by switching our attention to the parts of the whole:

> my next example, which is the giving of a speech. It includes five levels; namely the production (1) of voice, (2) of words, (3) of sentences, (4) of style, and (5) of literary composition. Each of these levels is subject to its own laws, as prescribed (1) by phonetics, (2) by lexicography, (3) by grammar, (4) by stylistics, and (5) by literary criticism. These levels form a hierarchy

> of comprehensive entities, for the principles of each level operate under the control of the next higher level. The voice you produce is shaped into words by a vocabulary; a given vocabulary is shaped into sentences in accordance with grammar; and the sentences can be made to fit into a style, which in its turn is made to convey the ideas of a literary composition. Thus each level is subject to dual control; first, by the laws that apply to its elements in themselves and, second, by the laws that control the comprehensive entity formed by them.
>
> Accordingly, the operations of a higher level cannot be accounted for by the laws governing its particulars forming the lower level. You cannot derive a vocabulary from phonetics; you cannot derive the grammar of a language from its vocabulary; a correct use of grammar does not account for good style; and a good style does not provide the content of a piece of prose. We may conclude then quite generally . . . that it is impossible to represent the organizing principles of a higher level by the laws governing its isolated particulars (Polanyi, 1966, pp. 35-36).

Chomsky likewise notes the absurdity of regarding the system of generative grammar as a point-by-point model for the actual construction of a sentence by a speaker:

> It would clearly be absurd to suppose that the "speaker" of such a language, in formulating an "utterance," first selects the major categories, then the categories into which these are analyzed, and so forth, finally, at the end of the process, selecting the words or symbols that he is going to use (deciding what he is going to talk about). (Chomsky, 1965, p. 140).

To think of a generative grammar in these terms, says Chomsky, is to take it to be a <u>model of performance</u>, rather than a <u>model of competence</u>, thereby totally misconceiving its nature.

As most contemporary linguists would point out, a generative grammar as it stands is no more a model of the speaker than it is a model of the hearer. Rather, as has been repeatedly emphasized, it can only be regarded as a characterization of the intrinsic tacit knowledge or competence that underlies actual performance.

In addition, within the developmental matrix in which knowledge of the sentences of a language is acquired, children also acquire knowledge of a set of ways in which sentences are used. From a finite experience of speech acts and their interdependence with sociocultural features children (language-acquisitioners) develop a general notion of the speaking appropriate in their community, which they then employ, like other forms of tacit cultural knowledge (competence).

The problem for the linguist, notes Chomsky, as well as for the child learning the language, is to determine from the data of performance the underlying system of rules that has been mastered by the speaker-hearer and that he puts to use in actual performance (Chomsky, 1965).

The question now is--to what extent can this linguistic model of competence-performance be applied to teacher bheavior? Before embarking on that task of theory translation, an insert on becoming a primary teacher follows so that the writer and reader can have a set of four teacher behavior protocols over which to jointly muse.

BECOMING A PRIMARY TEACHER[1]

Richard, aged ten, wrote the following piece:

'e t h den ai Hshel see diat dihai a r di i hand
i malal a r d it hat et itgn ah in nen di at
sTep Het stl Ahat d gn al d en ek h ai ard in
di n al in l at d i hai has as hen a at din rd
i see i see cat bis hand i Mardel ard i sit al
eh en'

and so on for three more lines. He had written this for a student teacher, Penny, who had taken him and the rest of the class for a walk in the woods. In his folder of work for the term there were other pieces of this kind. He had written like this every day, day after day, not just for one term, but probably every day for the last four years. Why hasn't anyone said, 'Stop!' 'Enough!' Day after day he is faced with the same brick wall, and day after day he hurls himself against it, fails and knows he fails. No one has taken this child off the wheel of perpetual failure. No one has said that whatever else could be tried, it couldn't produce worse results. Only the unquestioning acceptance of the narrowest of traditional forms of learning could possibly have so stultified so many friendly and conscientious teachers.

On one of my visits to the school Penny, the student, had a group of eight children one morning with some musical instruments she had found in a cupboard. She asked Richard to play for me, and even to my ears he seemed to be producing a most intricate set of rhythms on his chime bar and drum, which he had composed himself. The student's comment on the child was that he didn't talk to anyone, was a very 'tight' child, even his lips were 'tight.' She thought he needed to be talked to a great deal.

This child is regarded as a school failure. He would scarcely score anything on any kind of attainment test. But no one really knows what he can do. He is perpetually offered the narrowest of educational diets, is offered very little alternative other than writing in which he can make any kind of statement about like, but cannot use

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[1]This excerpt by Connie Rosen comes from an article entitled "The Content of Teacher Education" by Connie Rosen and J. H. Higginson in the Spring 1972 issue of the London Educational Review, pp. 31 - 36.

writing. He remains locked within his own tight world, cut off from those around him in school. He had undoubtedly been surrounded with innumerable words on pieces of card in every classroom he's been in. But all the word games and phonic work and reading courses in the world will do nothing and have done nothing to unlock this child.

It is quite a tall order to provide a course in a college of education that will produce teachers with the kind of qualities needed for teaching Richard. Of perhaps it's really all one quality, a respect for children. Richard isn't exceptional. Most children achieve higher standards in reading and writing than this, but all have a variety of talents which lie locked away, unknown to themselves or the people around them, for the simple reason that they are never given an opportunity to use them. The same is true of teachers and students. But if we keep our eye firmly on Richard we can find out what we have to do in college.

It's the connexions that matter. It's a far cry meeting Richard in school to listening to a lecture on the functions of education and trying to establish a connexion between the two. We seem to be most better at putting things into separate boxes than at establishing relations. It is the relation of personal meaning to public meaning, the relation of practice and theory and the relation between college and school which are important.

It would be helpful, for example, if we could ask the three disciplines to contribute on important educational controversies such as 'home and school', 'innovation in the curriculum' or 'language and learning'. The alternative approach, dictated by the needs of external examinations, leaves most students bewildered or bored. They lack the practical experience against which to judge the theory, and are unacquainted with the mode of discourse to engage in the discussion at a theoretical level. Some explode into heated argument when they sense underlying assumptions disagreeable to them, and are told they cannot possibly understand the full implications of it all.

They are promised exciting revelations by the end of the course, and when the gratification apears to be indefinitely deferred, they resort to a few textbooks to give them enough to pass an examination. They can scarcely do more with such a quantity of material that seems to lack unity, coherence or relevance. They do enough to get them by. They have had plenty of experience in their previous schooling to know how to do it, how to engage the enemy, how to keep him at bay, and how to defend themselves against the mystification.

In the process some become cynical and disenchanted, while others assume themselves to be too foolish to cope with such profound ideas. The theoretical course creates the same kind of brick wall for many students that school learning presents to Richard. It could ensure the perpetuation of the kind of school learning that Richard has experienced so far.

But what should the course contain? What do we want them to learn? It is no easy matter to find out what anyone learns from anything, particularly in teacher training. The correlation between learning and teaching, between what people think they have learnt and what they have actually learnt, between what a course sets out to do and what it actually achieves, between short-term and long-term effects is notoriously inaccessible.

Indeed, one might argue that the true significance of any kind of teaching is that it should indeed be immeasureable and long term. No diagrams or models or programmes, however immaculate on paper, can tell us anything if we don't know who the people were and how the work was done. It is, therefore, to the students themselves that I turn to give their own account of how it was while it was happening.

Paul, a postgraduate student on a one-year primary course, chose to do his education study on music making in school. He called it 'primary sounds'. He worked with a group of seven-year-olds one day a week over a period of a term, and the following are some very short extracts from his study:

(He explains how he took the group of children to the railway station and how they recorded all the sounds they heard on a tape-recorder.) 'The following day we played the tape back. These disembodied sounds, taken out of their environment and context seemed rather changed from the day

before. We then decided to take the train rhythm as our starting-point for our work, and we all clapped it out together. This they soon got used to, and so we practised slowing down and speeding up, which was a little more difficult and necessitated following a leader or conductor who was selected from the group.' They then replaced the leader with a heavy drum beat to keep them in time. 'Next came the problem of writing the rhythms down. This I left entirely to them and they came up with a series of dots for the clapping and lines for the drum:

...o ...o ...o ...o

They then, in their own time, wrote out the whole train journey, showing the speeding up and slowing down.'

They went on to make a programmatic sequence including bell ringing, siren, the train stopping, doors slamming, the guard's whistle, the train under the bridge, and so on. He left them to write this down as they wished and they used symbols to represent each sound. He then added some words and they used the names of the stations for this, beginning with clapping the names and finally writing these down. 'For the melody line, they each in turn make a tune for each station name, using the chime bars C, E, G that were available. We sang the tune several times until we all knew it well and then added the rhythm of the train once more, which led to the whole piece being performed again with the tune added. One girl spent all her break time practising the tune on the chime bars so that she could play it with us, soon followed by another girl on the xylophone, so these were given solo places before and after the singing.'

Paul goes on to explain how they wrote down the tune that had been composed and then quotes one of the children commenting on looking at the final 'score' that it was just like 'real' music. His own comment was: 'The result of this work was a real piece of music which was created direct from observation. The children had previously done no music at all except a little singing. None was more able than the others. It was only a start, but just that short while spent on it seemed to spark off an interest in such activities and a greater awareness of sounds.'

This example of shared learning occurred in the making of a piece of music, Both children and student made something they had never made before, and certainly no one would have suspected that the children would have been capable of doing such a thing. But the learning is also shared by the whole group of students in college. It is significant enough to be discussed at a variety of levels. Do we in fact only work from the children's own interests, waiting for some child in the class to prompt some work on his own interest in Roman coins or stamps or football?

What did the teacher offer? Has he contributed to the children's interests, aroused curiosities, stimulated them to new efforts? How much did they participate, make suggestions, offer ideas of their own? Some very curious and contradictory statements are made about 'discovery', 'activity', 'play', 'child-centred education', 'learning', 'the role of the teacher' and all the rest of it. One must learn how to test these statements against one's own experience. The problem is to create enough situations of this kind so that students will achieve this kind of result.

Paul couldn't have learnt it if he had taken forty children to London Airport or a group of eighty children for hymn singing in the hall. Paul's experience provided an opportunity to learn something in depth. It is strange how often students are placed in such very unproductive situations. But this is teaching in microcosm (not micro-teaching!). In order to carry out this kind of learning students need a considerable amount of support and help from college tutors and teachers, particularly in schools which do not encourage this approach.

Something of the same kind of learning and teaching can be seen in the account of another postgraduate primary student, Valerie. She was working with a group of seven-year-old children on number. On this occasion a group of students with the tutor 'took over' the whole of three seven-year-old classes in a junior school for one afternoon a week throughout a term. What the students did in school affected what they did in college. The talk, the reading, the making of the number apparatus and the partici-

pation of the teachers both in school and in college were related to their meetings with the children. The teachers saw the students in school with the children, came to talk and work with them in a maths workshop in the college and brought other items of children's work with them for the students to discuss. Valerie writes of one occasion:

'I was pleasantly surprised to be welcomed by the children, who obviously remembered me. We began straight away by each counting out the beans from a pile. Then the children "grouped" them in as many different ways as they could think of and wrote down the results. Only two of the children found all the variations with two groups. The other two children branched off into three and four groups. The fifth child, Keith, could not manage this, so we practised counting and then re-arranging and counting. . . .

'With the others I tried to help them to draw a conclusion from their work - "How many 4s in 100?" Although they could tell me how many squares they had coloured, they did not see the connexion, so I think I was going too far. I think all the children need quite a lot of practice in simple arranging and grouping of numbers up to 25. . . . Stephen and Judy worked their way through a couple of work cards, using the number track to help them. They were keen to try adding the numbers in their heads, but after making mistakes which would have been avoided had they used the track, they went back to using it. . . . Kevin had practice in counting and grouping numbers of beans. He seems to understand conservation of numbers but had difficulty in matching "one to one". He is confident of numbers up to 10, but after this he becomes very muddled unless he is counting straight on from 1 to 20. He made the lines the same length without regard to the actual numbers. . . . He cannot distinguish 14 from 41 and other such numbers.'

It takes a long time to teach students how to recognize individual differences in children and how to adapt one's teaching to this. It takes a long time to learn that class teaching has very limited value and can be used only on

some occasions for some purposes. It also takes a very long time to teach students how to set up group activities in a classroom and the purpose of it. Building the confidence and ability to do this depends on many things, but it scarcely can be done by tutors or teachers who have not experienced how to do it themselves. So much of this depends on the kind of exchanges that are taking place between everyone concerned. It also seems to take a long time to learn that communication is supposed to be a two-way process even in schools. Christine, another student on the one-year course, finds her own way of doing it:

'During the last part of the morning I had a fascinating conversation with Michael P., Matthew and Michael W. Matthew happened to say that he had seen a play where a woman tried to get in touch with the spirit of her dead husband through a medium. He said he thought that life didn't come to an end at death but we were reborn, possibly in another shape. Michael P. said he didn't agree - after death we would be like the piece of paper he was writing on - thoroughly dead with no spark of life. Michael W. said it was possible that the world was just a dream and when we died we would wake up. They all agreed that they would never know the truth, but this did not seem to worry them unduly.

Then Matthew said that in a sense we could never die completely because when we did we eventually became part of the soil after burial and decay, which then would produce grass, which would be eaten by a cow, who would give milk to someone to drink. Therefore, when we drank our milk, we might be drinking part of somebody. This, again, did not worry them. It was time to go then, but I heard the conversation continuing as the boys went out.'

Part of the ability to learn about others is learning about oneself. I am not asking for formal courses on self-analysis, introspection or self-criticism, but if one had the impertinence to ask students, one might easily judge the value of the course by the kinds of self-awareness it had prompted. Penny and Paul and Valerie and Christine are learning something about themselves as well as about the children. They do it by encouraging them to use their own talents and abilities and personalities.

> In the short space of an article it is not possible to explore the full technicalities of a course. It must obviously include enough to give students help in what they do with children, but the whole is more than the sum of the parts. It is the engagement of the imaginative and creative qualities of young people which is the aim. And the key to it is the nature of the meeting between students and children. It is the quality of this meeting, the kind of encounter that is made possible between students and children which should control what we do on the course. It is from the point of view of the authentic moment that we should look at the kinds of theoretical and practical experiences we are giving to students.
>
> (With acknowledgements to the students of Goldsmiths' Postgraduate Primary Course and Trent Park College of Education.)

The above protocols present accounts of particular encounters of beginning teachers with primary school children. In the case of Penny, Valerie, and Christine we have essentially a single episode, whereas in Paul's protocol we have a string of related episodes in which he continues to carry his music project a step further each time. What we have reported above are observations (in some instances self-observations) of <u>teacher performance</u>. This is how these four individuals interacted with a group of children on a specific occasion. It is possible to represent these encounters visually with the following diagram (see Figure 1).

It should be clear to the reader that all of these episodes of teacher behavior are very context-bound. That is to say, these encounters did not take place in isolation but in some specific instructional setting and that the

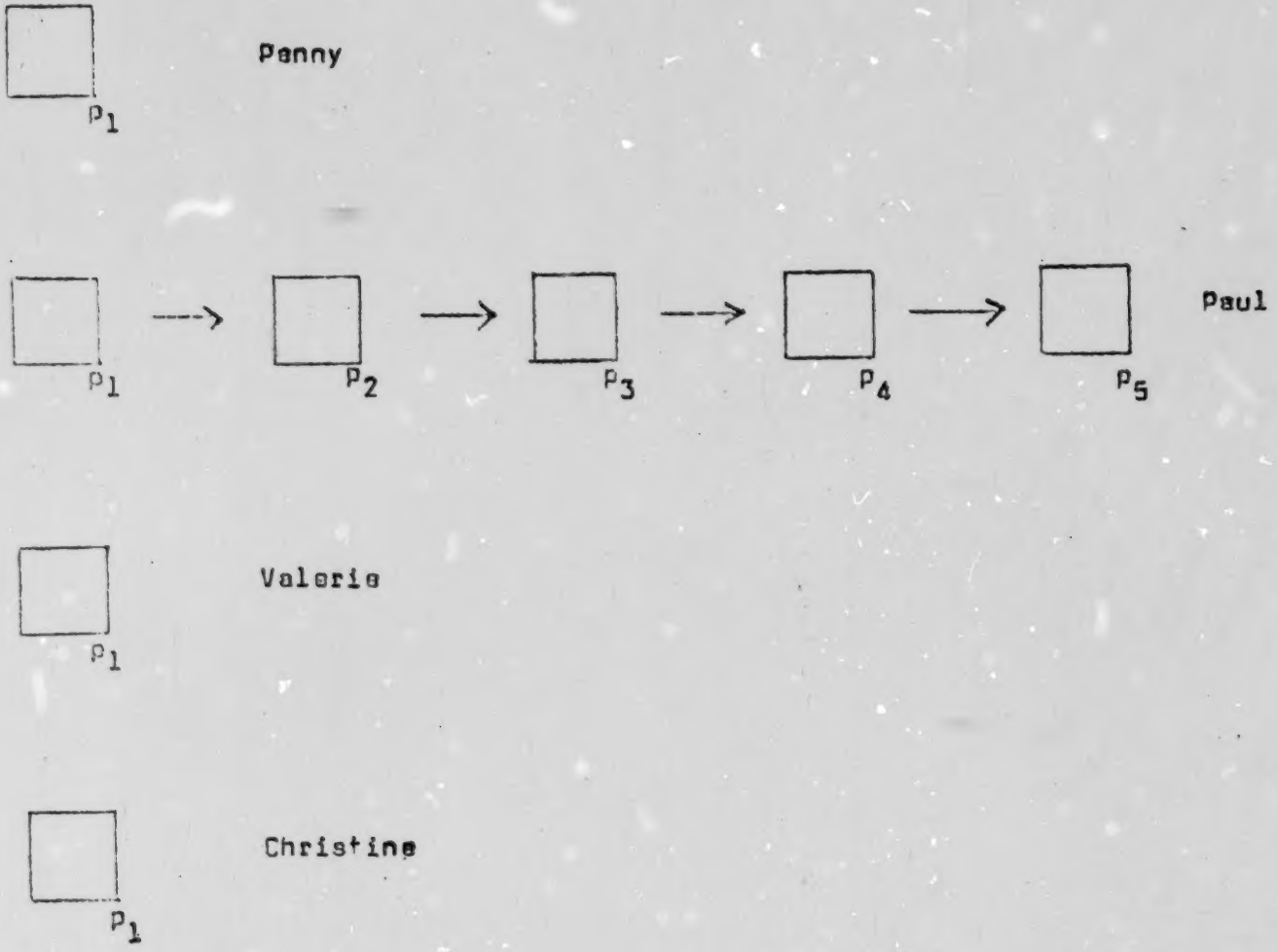

Figure 1. Individual Teaching Performance

particular children, the particular school, the regular teacher, the materials available are all contributing variables to the resulting experience. Figure 2 seeks to portray the teaching performances in their various contextual settings.

One might project that, if these four individuals were rotated among the four settings, at least one-half of the episodes would be different. Situational variables in the above accounts appear to be dominant in two of the cases, while individual interests on the part of the student teachers seem to be a pivotal force in two others.

In making predictions from one performance to another the likelihood of making a correct prediction then is not apt to be greater than .50. See Figure 3 at this point.

Our interest is not solely in whether these four particular episodes would be replicated in new settings, however. We are more interested in the question of to what extent these individuals will act competently in any new instructional setting. Figure 4 seeks to represent this larger framework of concern.

It seems plausible now, before presenting a generalized model of teaching performance and teaching competence (as opposed to the individual models for the four individuals), to define teaching performance and teaching competence.

<u>teaching performance</u> - what the teacher actually does, i.e. observable teacher behavior

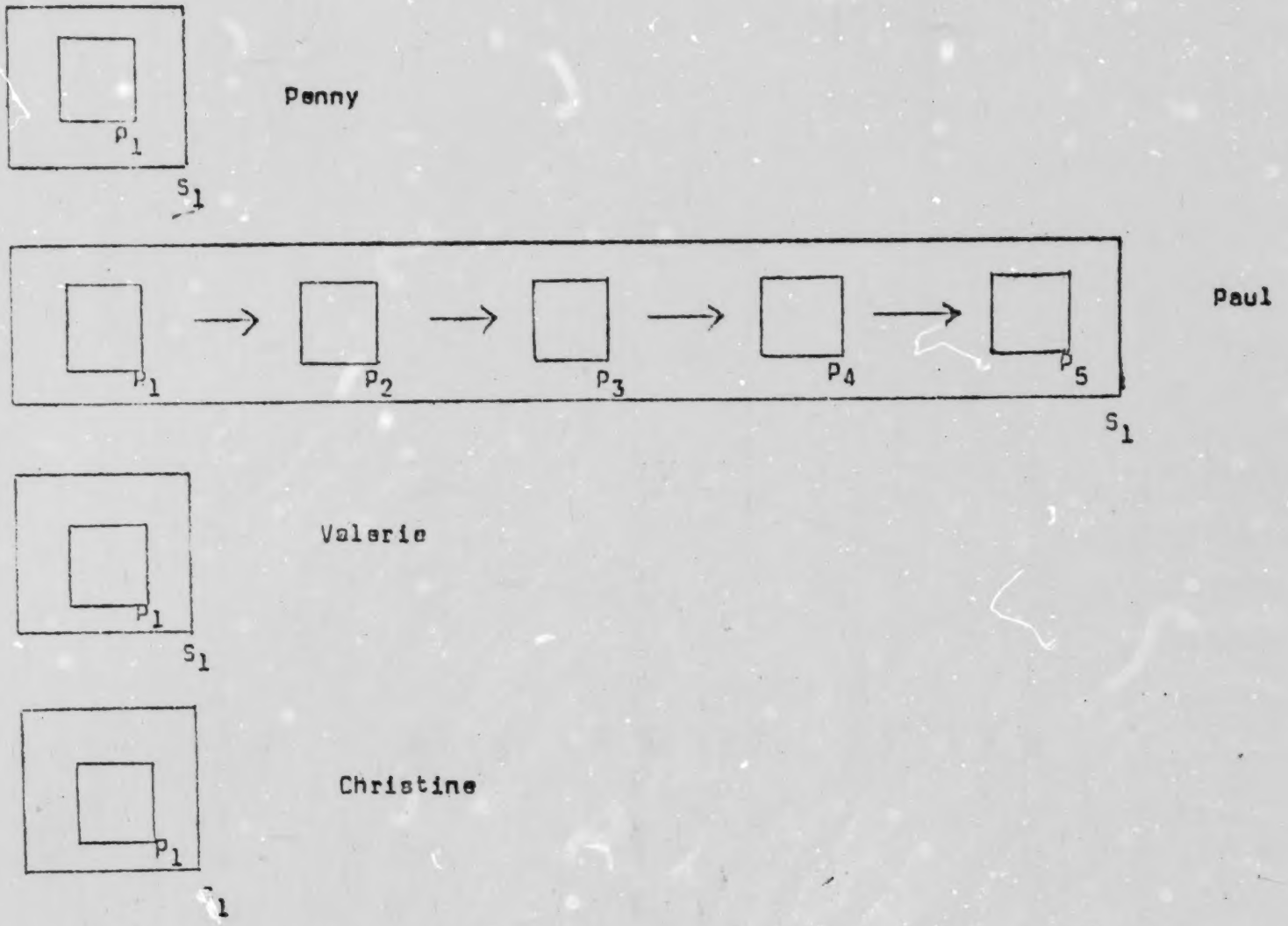

Figure 2. Individual Teaching Performance in Instructional Settings S_1 . . . S_n

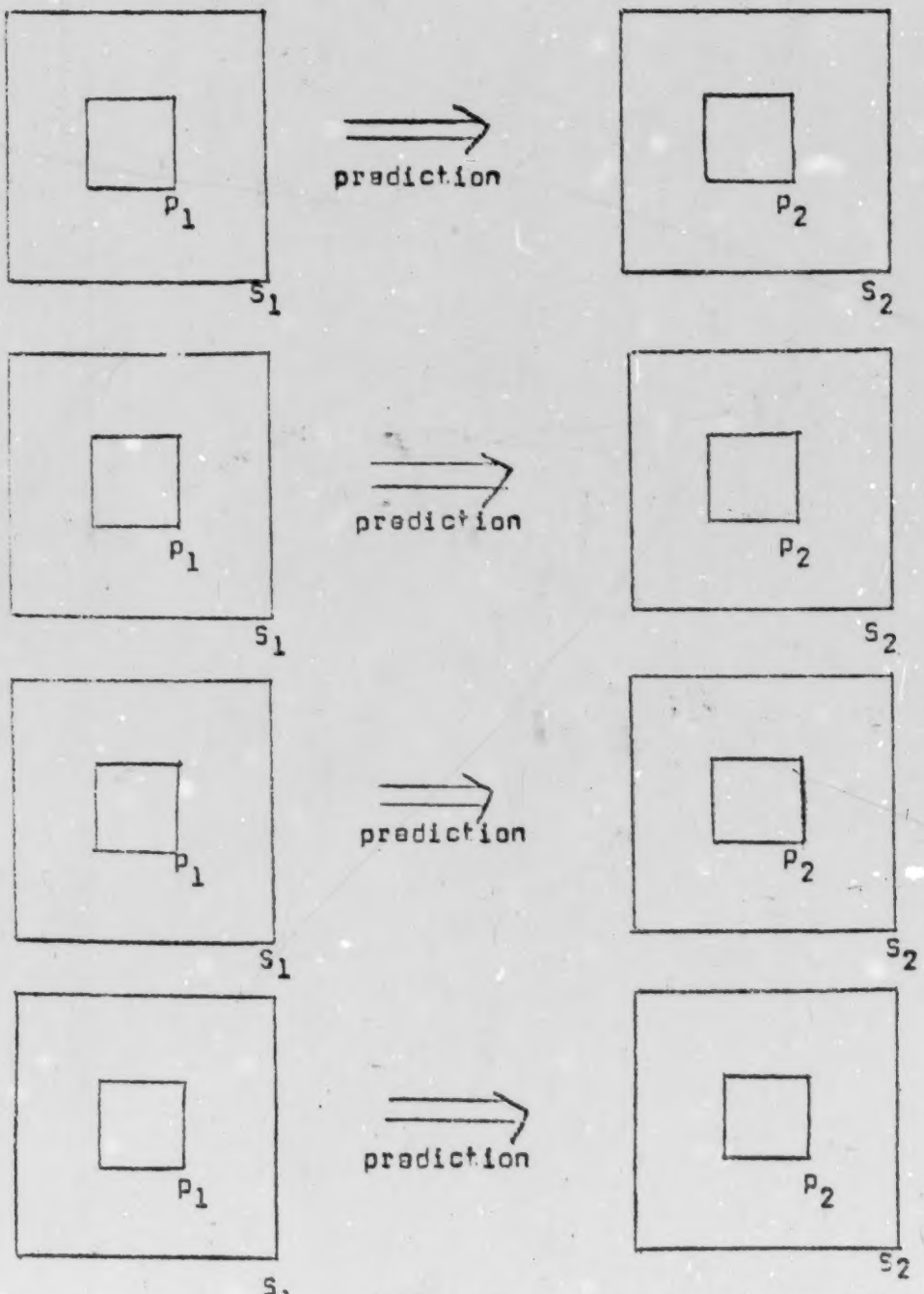

Figure 3. Making Predictions About Teaching Performance

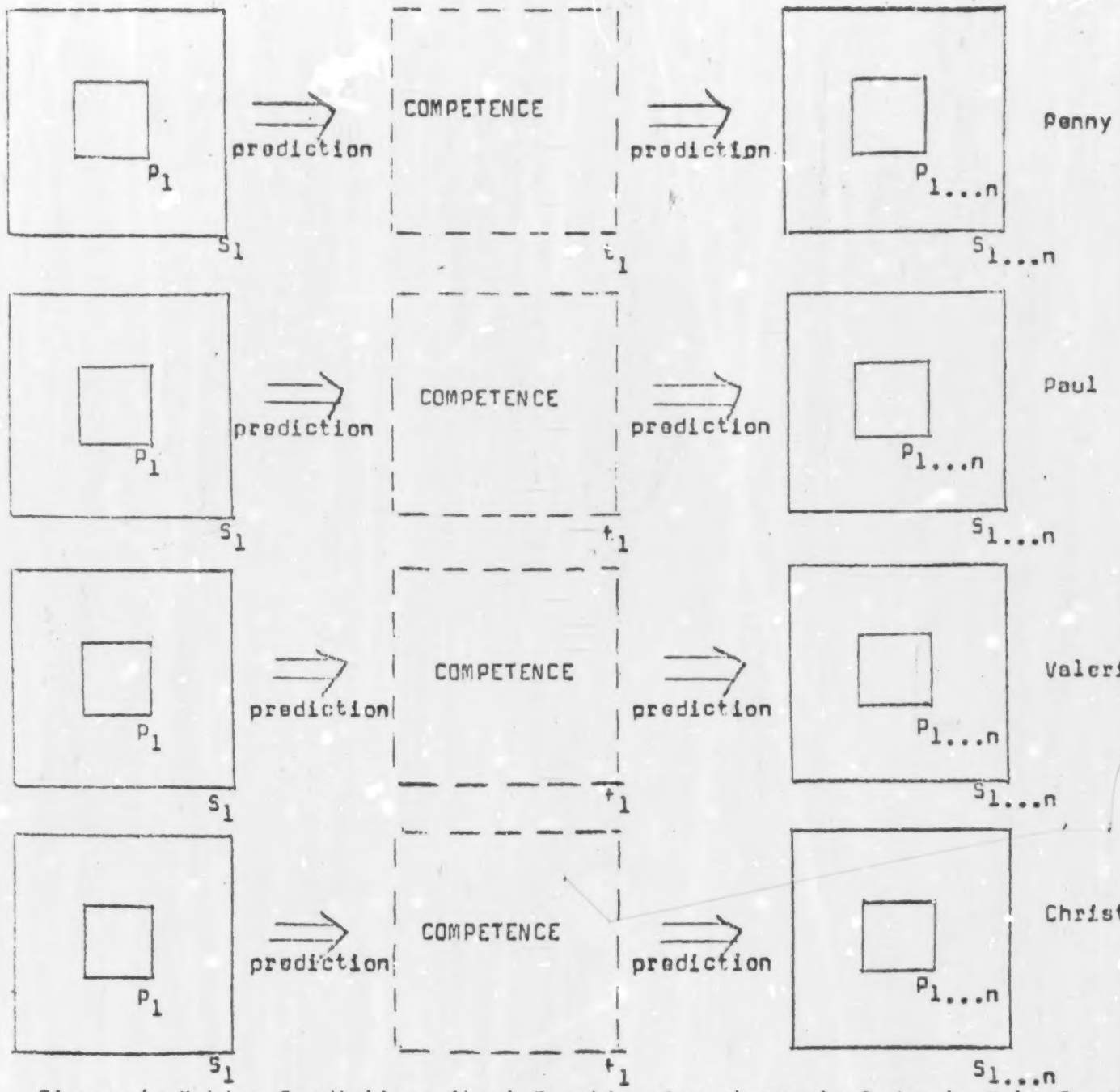

Figure 4. Making Predictions About Teaching Competence in Order to Make Predictions About Future Teaching Performance

teaching competence - the underlying, tacit knowledge which a teacher possesses--including knowledge of content, pedagogy, socio-cultural setting, etc.

To clarify further the distinction between teaching competence and teaching performance, we will speak just a little longer from a purely theoretical point of view. Teaching competence is not to be confused with teaching performance. Teaching performance, that is, what the teacher actually does, is based not only on the teacher's knowledge of the instructional content and pedagogy, but on many other factors as well--factors such as non-pedagogical knowledge and beliefs, distractions, memory restrictions, fatigue, availability of instructional materials, etc.

In studying actual teaching performance, then, one must consider the interaction of a variety of factors, of which the underlying competence of the teacher is only one factor. We may, if we like, think of the study of teaching competence as the study of the potential performance of an idealized teacher who is totally unaffected by such factors. However, observations of teaching behavior do not necessarily lead to a statement of the teacher's competence. It is a summary of his/her performance. Moreover, it should be seriously questioned whether a theory of teaching competence can ever be developed from the manipulation of a collection of teaching protocols.

Teaching competence then should not be viewed as a

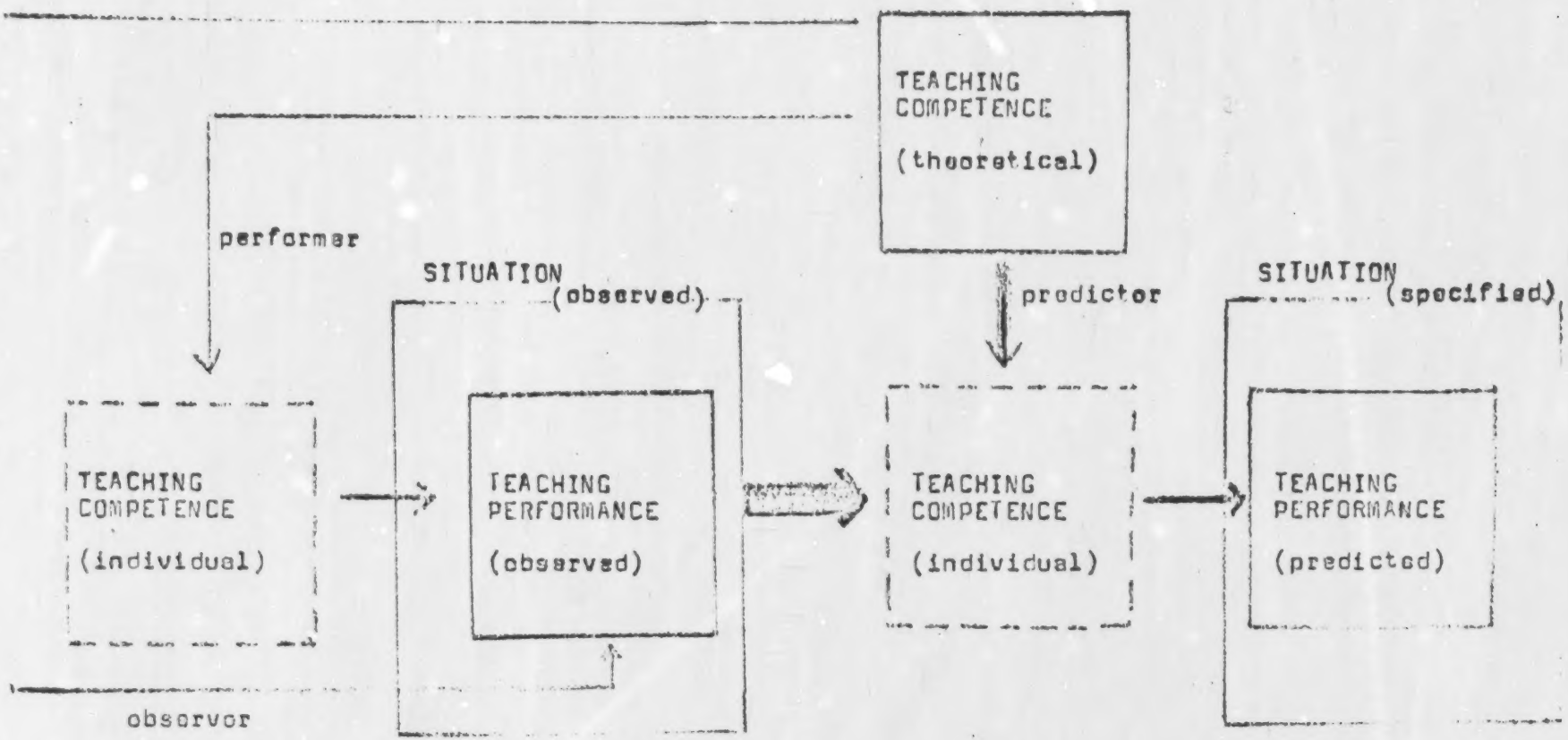

Figure 5. A Generalized Model of Teaching Competence and Teaching Performance

systematic inventory of items but as a system of generative processes. Competence in teaching implies that the teacher has in his/her "mind" a number of generative procedures (whether "innate" or "learned") and is capable of "storing" and operating upon such "structures" in the course of producing specific teaching behavior.

The problem for the theorist, as well as for the beginning teacher, is to determine from the data of performance the underlying system of pedagogical understanding that has been mastered by an experienced teacher and that he puts to use in actual performance. Within the developmental matrix in which pedagogical knowledge is acquired, beginning teachers also acquire knowledge of the way in which verbal and nonverbal pedagogical moves are used. From a finite experience (their own schooling and the teacher training experiences provided for them), beginning teachers develop a general notion of the teaching appropriate to their group of children.

Thus we should see the absurdity of regarding teaching methods courses as point-by-point models for the actual construction of a teaching episode. It seems reasonable to also question whether the same paradox holds true in acquiring teaching behavior as in the acquisition of linguistic behavior. We referred earlier in this paper to the fact that there is general agreement that grammatical performance is based on grammatical knowledge, but also simultaneous agreement that

explicit teaching of that knowledge has no effect on that performance. It may also be true that while teaching performance is based on teaching competence, it is also simultaneously true that explicit teaching of that knowledge has no effect on performance.

At any rate, teaching performance, quite likely does not reflect a teacher's knowledge, that is, his competence, perfectly. As with language performance, it is also difficult to decide if an observed difference between a beginning teacher's performance and the performance of an experienced teacher is due to competence or performance factors.

We are limited to observed teaching performance. As with language, there are sampling problems--does the absence of an item from the teaching behavior mean the teacher cannot produce it or merely that he did not find it necessary to produce it?

The observational adequacy vs. descriptive adequacy of teaching behavior category systems is a question that should also be raised. A category system is observationally adequate if it accounts for, that is, generates, the teaching behavior that has been observed. But a descriptively adequate system should be capable of generating all possible teaching behavior.

Only under idealized conditions can teaching behavior be taken to be a direct reflection of teaching competence. In actual fact, teaching performance cannot ever directly reflect teaching competence. Observation of actual teaching

behavior will show numerous false starts, deviations from plans, etc. Teaching competence, then, is concerned with an ideal teacher, in a completely adequate classroom, who knows the pedagogy and content perfectly, and is unaffected by classroom conditions of crowding, inattention, distractions, etc.

A distinction between teaching competence and teaching performance is therefore both a theoretical and a methodological necessity. Teaching performance is the teacher's actual behavior in concrete situations. Teaching competence is the unconscious, tacit knowledge that underlies teaching behavior.

Many of the pedagogical moves of experienced teachers (samples of their "performance") will, for various reasons, be full of errors--because in normal conditions of teaching, teaching performance takes on features that cannot be generated solely by teaching competence. It would appear that at the present time there is only the most fragmentary knowledge of the relevant parameters of a theory of teaching performance. The problem is real, of course--just how the information represented by teaching competence is realized in specific teaching acts.

Teaching episodes are they occur in classrooms are also probably not single performances but would more properly be viewed as embedded:

$$(\ \ (\ \ (\ p_1\ )\ )p_2\ \ )p_3$$

Teachers or teacher candidates cannot be called upon to perform p_1 in isolation. It will be possible, on the other hand,

to collect protocols, i.e. observations, but these must then be "unpacked" for the purposes of certifying what is present in the performance and in making conjectures about the underlying competance of the individual.

It should now be clear that breaking teaching as a concept up into 1000s of components, looking for these individually in a candidate, expecting that these are simply additive, is erroneous. Paul certainly exhibits numerous teacher performance features that are to be applauded. But to think that hundreds of students can be programmed through a linear sequence such that (with preserverance) they too will have an encounter with children just like the one which Paul had is . . . well, to be blind to the sharp distinction between competence and performance in teaching.

Your reaction to this formulation of the concepts of competence and performance in teacher education depends, quite likely, on who you are:

the theoretician
the designer (college or consortium)
the performer (beginning teacher)
the supervisor (college or school)
the observer (college or state dept.)
the predictor (college or state dept.)
the researcher

Regardless of which role or combination of roles you must assume, there are competing frameworks vying for your attention and loyalty:

the theoretician - "competencies" by the score
teacher behavior category systems$_{1...n}$
a linguistic model of competence and performance

the designer - field-based vs. college-based
"competencies" by the score
criterion-referenced measurement

the performer - teacher behavior category systems$_{1...n}$
"competencies" by the score
Ryan's equation

the supervisor - "competencies" by the score
criterion-referenced measurement
teacher behavior category systems$_{1...n}$

the observer - teacher behavior category systems$_{1...n}$
criterion-referenced measurement

the predictor - "competencies" by the score
Bayesian analysis

the researcher - teacher behavior category systems$_{1...n}$

It seems useful here to make two further suggestions to help (1) the performer and (2) the predictor to get a handle on how to apply this linguistic model of competence and performance to his own particular point of view.

Ryans, in a classic work nearly ten years ago, developed a conceptual framework in which the teacher system and the pupil system are described in terms of information flow and

processing (Ryans, 1965). Ryans viewed the teacher as an open, self-organizing and self-regulating system. The teacher information processing system culminates in teacher behavior which is output of the teacher system and input for the pupil system. Ryans thus sees the overall teacher behavior of teacher i as being the resultant of the motivating, presenting, organizing, evaluating, and counseling behavior of teacher i, interacting with the various situation conditions. He uses the following equation:

$$tb_{i_j} = f/(tbp_{1_i} \ldots tbp_{n_i}),\ (s_{\overline{pb}_{1_j}} \ldots s_{\overline{pb}_{n_j}}),\ (s_{ad_{1_j}} \ldots s_{ad_{n_j}}),\ (s_{cul_{1_j}} \ldots s_{cul_{n_j}}),\ (s_{lm_{co_{1_j}}} \ldots s_{lm_{co_{n_j}}}),\ (s_{lm_{a_{1_j}}} \ldots s_{lm_{a_{n_j}}}),\ (s_{pb_{lm_{g_{1_j}}}} \ldots s_{pb_{lm_{g_{n_j}}}}),\ (tb_{\overline{tb}_i}),\ (e)/$$

where

tb_{i_j} = the instrumental behavior (phenotypical) of teacher i in teaching situation j.

$tbp_{1_j} \ldots tbp_{n_i}$ = teacher behavior patterns of teacher i

$s_{\overline{pb}_{1_j}} \ldots s_{\overline{pb}_{n_j}}$ = a current situation condition represented by the sum total of behaviors of pupil 1...pupil n (i.e., the group or class of pupils participating) in teaching situation j; and where pb_{n_j} is defined as the sum total of behaviors of individual pupil n in learning situation j.

$s_{ad_1 j} \ldots s_{ad_n j}$ = current situation conditions represented by administrative policies, controls, directions, etc., which must be taken into account in situation j.

$s_{cul_1 j} \ldots s_{cul_n j}$ = current situational conditions represented by cultural factors which bear on situation j.

$s_{lm_{co_1 j}} \ldots s_{lm_{co_n j}}$ = current situational conditions represented by the learning materials content (e.g., knowledge, attitudes, skills, processes . . .) in situation j.

$s_{pb_{lm_{g_1 j}}} \ldots s_{pb_{lm_{g_n j}}}$ = current situational conditions represented by pupil behavior goals or objectives in situation j.

$tb_{\overline{fb}_i}$ = sum total of feedback resulting from behavior of teacher i in previous teaching situations having elements in common with situation j.

e = error. (Ryans, 1965, pp. 38-39)

Those with responsibility for making predictions about teaching behavior should find Bayesian analysis to be useful. Bayesian analysis employs probability theory in the making of decisions (Meyer, 1966; Enis & Broome, 1971; Savage, 1954). Using the Theorem worked out by the English mathematician Thomas Bayes--which demands knowledge of certain a priori probabilities:

$$P(A_j/B) = \frac{P(A_j)\,P(B/A_j)}{\sum_{i=1}^{n}\left[P(A_i)P(B/A_i)\right]}$$

it is possible to determine the likelihood of an event occurring.

Let's suppose that, on the basis of his experience, judgement, and general knowledge of the situation, the decision maker estimates the probability to be .5, .3, and .2 for the occurrence of S_1, S_2, and S_3 respectively (where S_1 is a school assignment or position in the South Bronx and S_3 is a teaching job in Bayside). There are, say, three teacher training programs or courses of action available to the student: A_1, A_2, and A_3.

Given a priori data on the teaching performance of previous individuals who have gone from programs A_1, A_2, and A_3 to S_1, S_2, and S_3, it should be possible to estimate or predict the teaching performance of any new student.

The competence-performance paradigm is not a new invention. It has existed in the field of linguistics for a long time. It is hoped, however, that its articulation as a possible model for teacher education will provide the phenomena of teaching performance and teaching competence with a theory-determined place in the teacher educator's field of vision.

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